(19) FEDERAL REPUBLIC OF GERMANY

GERMAN PATENT OFFICE

(12) **Application Laid Open**

(10) **DE 195 46 528 A 1**

(51) Int. Cl.[6]:
A 62 C 35/02
A 62 C 5/00
C 09 K 3/30

(21) File number: 195 46 528.8
(22) Filing date: 12/13/95
(43) Date laid open: 6/19/97

DE 195 46 528 A 1

(71) Applicant(s):
Dynamit Nobel AG, 53840 Troisdorf, DE

(74) Representative(s):
Patent Attorneys of Kreisler, Selting, Werner et col., 50667 Cologne

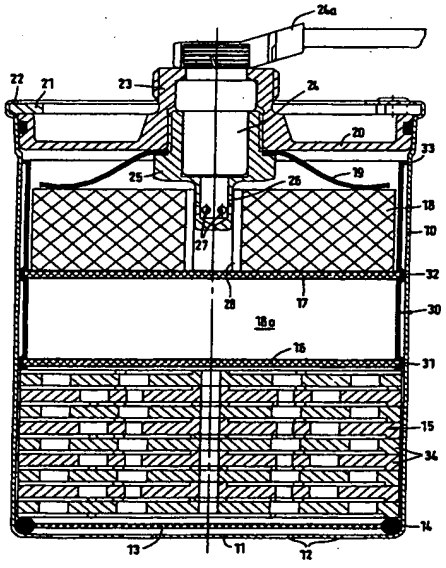
(72) Inventor(s):
Dell, Klaus, 57290 Neunkirchen, DE; Kaiser, Wolfgang, 35708 Haiger, DE; Müller, Joachim, 57299 Burbach, DE; Richter, Ulf, 57299 Burbach, DE; Schillinger, Ehrfried, 57299 Burbach, DE

(56) Printed publications taken into consideration for the assessment of patentability:

DE	44 19 099 A1
EP	05 69 025 A2
SU	8 20 834

(54) Aerosol-generating fire extinguisher

(57) The fire extinguisher comprises a housing (10) in which an aerosol-generating assembly (18) is arranged which is ignited by an igniter (24) via an ignition unit (26). An inner sleeve (30) made of thermally insulating material is inserted into the metal housing (18). The inner sleeve consists, for example, of cardboard or another material which carbonizes during burn-up of the assembly (18) and forms a thermally insulating layer on the inner wall of the housing (10). The thermal load of the housing (10) is thus reduced and a proper burn-up of the assembly (18) is ensured.



DE 195 46 528 A 1

The following specifications have been taken from the documents filed by the applicant

FEDERAL PRESS 04.97 702 025/157

Specification

The invention relates to an aerosol-generating fire extinguisher according to the preamble of patent claim 1.

This type of fire extinguisher is known from EP-A-0 569 025. This fire extinguisher has a housing which, among other things, contains an aerosol-generating assembly which forms an aerosol during burn-up which is used for the extinguishing of fires, for example in transportation devices or in closed rooms of buildings. An ignition unit is provided for the ignition of this assembly.

In German Patent Application P 44 19 098, which is considered the state of the art in accordance with § 3 Paragraph 2 Patent Law, a fire extinguisher is described which contains an aerosol-generating assembly, a reaction chamber and a cooling structure in succession in a housing. The aerosol flows through the cooling structure and leaves the housing through the holes of a perforated base. The cooling structure serves to dissipate a portion of the reaction heat and hence to cool the aerosol which flows out.

It is the object of the invention to produce an aerosol-generating fire extinguisher in which a clear reduction of the outer temperature of the housing is achieved without producing harmful gaseous compounds.

This object is achieved according to the invention with the characteristics indicated in patent claim 1.

In the fire extinguisher according to the invention, there is an inner sleeve present in the housing which encloses the aerosol-generating assembly. During burn-up of the assembly, as a consequence, the hot combustion gases do not come into direct contact with large areas of the inner wall of the housing, so that the housing is protected from thermal destruction. The housing thus retains its dimensional stability during the entire burn-up and carries out its function of allowing the hot aerosol – gaseous mixture – to flow out of the outlets as intended. Due to the

thermally insulating protective layer, the housing can be designed with thinner walls than would have to be the case without this inner sleeve.

In the fire extinguisher according to the invention, the thermally insulating inner sleeve has the following effects:

a) A clear reduction of the outer temperature of the housing during and after the burn-up of the extinguisher assembly.

b) Destruction of the housing is prevented.

c) No undesired toxic or environmentally harmful deposits are released during burn-up of the extinguisher assembly.

Cardboard is worthy of preferable consideration as a suitable thermally insulating medium in different wall thicknesses and lengths. Moreover, metal sleeves or molded bodies made of other inert substances such as ceramic, for example, with a defined spacing from the wall of the outer housing, are suitable.

The inner sleeve preferably does not only extend over the area of the aerosol-generating assembly, but rather encloses the reaction chambers and the cooling zone. The inner sleeve thus has the simultaneous function of a support sleeve.

Preferably, the inner sleeve consists of cardboard or a similar material which carbonizes during burn-up and forms a thermally insulating layer on the inner wall of the housing. In so doing, the inner sleeve only has a limited material stability and solidity. An inner sleeve consisting of a melting or flammable plastic would not form a thermally insulating layer on the inner wall of the housing and would lead to undesired gaseous compositions during burn-up of the extinguisher assembly. By contrast, with an inner sleeve made of carbon-containing material – cardboard, for example – a carbon layer forms which acts as a thermal insulator.

In the following, sample embodiments of the invention are illustrated in further detail with reference to the drawings.

Figure 1 shows a first sample embodiment of the aerosol-generating fire extinguisher according to the invention in longitudinal section, and

Figure 2 shows a modified sample embodiment.

The depicted fire extinguisher comprises a housing 10 of sheet metal, for example steel, whose base wall 11 is designed as a perforated wall comprising numerous outlets 12 arranged in a distributed manner through which the aerosol can flow out of the housing. In order to rule out the penetration of moisture or pollutants during the lengthy required operational viability of fire extinguishers, a moisture-tight barrier foil 13 is spread out from the inside of the housing (or, alternatively, from the outside) over the base 11 which is held by an edging 14. The edging 14 also serves as a spacer which holds the cooling apparatus 15 at a distance from the base 11 and causes the barrier foil 13 to be held at an axial distance from the cooling apparatus 15. The barrier foil 13 is partially penetrated under the pressure action of the aerosol in order to open up the outlets 12.

Upstream from the barrier foil 13, a cooling apparatus 15 is arranged through which the gases flow. A lattice grate 16 is located over the cooling apparatus 15 which, together with a further lattice grate 17 which is parallel to it, delineates a reaction chamber 18a. Over the lattice grate 17, there is an aerosol-generating assembly 18 which is pressed by a spring 19 axially against the lattice grate 17. The spring 19, which is designed here as an annular leaf spring, is supported on a cover 20 which tightly closes off the housing 10 and is set into the housing. The cover 20 is held into position by a retaining ring 21. The retaining ring 21 has a larger outer diameter than the cover 20 and is enclosed by a flange edge 22 of the housing 10. The cover 20 comprises an outwardly protruding central projection 23 which forms a seat for the igniter 24. A screw-in part 25 which is screwed into the central projection 23 from the inside of the cover secures the igniter 24 in the projection 23. In this sample embodiment, the igniter 24 is an electric igniter with contact clamps 24a onto which a charge can be applied in order to trigger the ignition unit 26.

The ignition unit 26, which protrudes axially from the screw-in part 25 to the inside of the housing, is provided with radial openings 27. The ignition unit 26 consists of a tube-shaped

appendage of the screw-in part 25, in which radial openings 27 are formed. The ignition unit 26 protrudes into an axial recess 28, preferably star-shaped in cross-section, of the assembly 18.

The assembly 18 and the lattice grates 16, 17 are enclosed by an inner sleeve 30 which comprises grooves 31, 32 for holding the edges of the lattice grates 16, 17 into place. The inner sleeve 30, together with the components contained in it, forms an insert which can be inserted, preassembled, into the housing 10. This insert is pressed by the spring 19 in the direction of the cooling apparatus 15. The inner sleeve 30 consists of thermally insulating, heat-resistant material and serves as thermal protection for the housing 10.

The inner sleeve 30 is provided on its upper end with a radially protruding flange 33 which, in the same manner as the grooves 31 and 32, is supported on the wall of the housing 10, while the inner sleeve 30 is otherwise spaced closely to the housing wall. The cooling apparatus 15 is not enclosed by the inner sleeve and its periphery is in surface contact with the wall of the housing 10. The cooling apparatus 15 consists of numerous perforated plates 34 which are layered over each other and are made of a heat-resistant metal with a good conductivity. The cooling apparatus effects a throttling of the aerosol stream and ensures an even flow of the aerosol at a defined flow rate.

In this sample embodiment, the inner sleeve 30 consists of cardboard which carbonizes during the burn-up of the assembly 18 and hence forms a thermally insulating carbon layer on the inside of the housing 10. The material thickness of the inner sleeve 30 is 0.5 to 3 mm, preferably 1 mm.

The sample embodiment of figure 2 corresponds to a great extent to the first sample embodiment, so that the following description can be restricted to the differences.

According to figure 2, the thermally insulating inner sleeve 30a is designed in such a manner that it extends as a cylindrical part over the entire length of the housing 10 and rests with its entire surface against it. A star-shaped folded ring 35 which delineates the reaction chamber 18a in its periphery is provided as a spacer between the lattice grates 16 and 17.

In this sample embodiment, the barrier foil 13 rests directly against the base wall 11. A further star-shaped folded ring 36 is supported on this which maintains a lattice grate 37 at a distance

from the base wall 11. A cooling apparatus 15 is located between the lattice grates 16 and 37 through which the aerosol gas mixture can flow axially to the housing.

Patent claims

1. Aerosol-generating fire extinguisher comprising a housing (10) which contains an aerosol-generating assembly (18) and an ignition unit (26), characterized in that the aerosol-generating assembly (18) is enclosed by an inner sleeve (30) made of thermally insulating material.

2. Fire extinguisher according to claim 1, characterized in that the inner sleeve (30) consists of cardboard or a similar material which carbonizes during the burn-up of the assembly (18) and forms a thermally insulating carbon layer on the inner wall of the housing (10).

3. Fire extinguisher according to claim 1 or 2, characterized in that the inner sleeve (30) has a material thickness of 0.5 to 3 mm, preferably 1 mm.

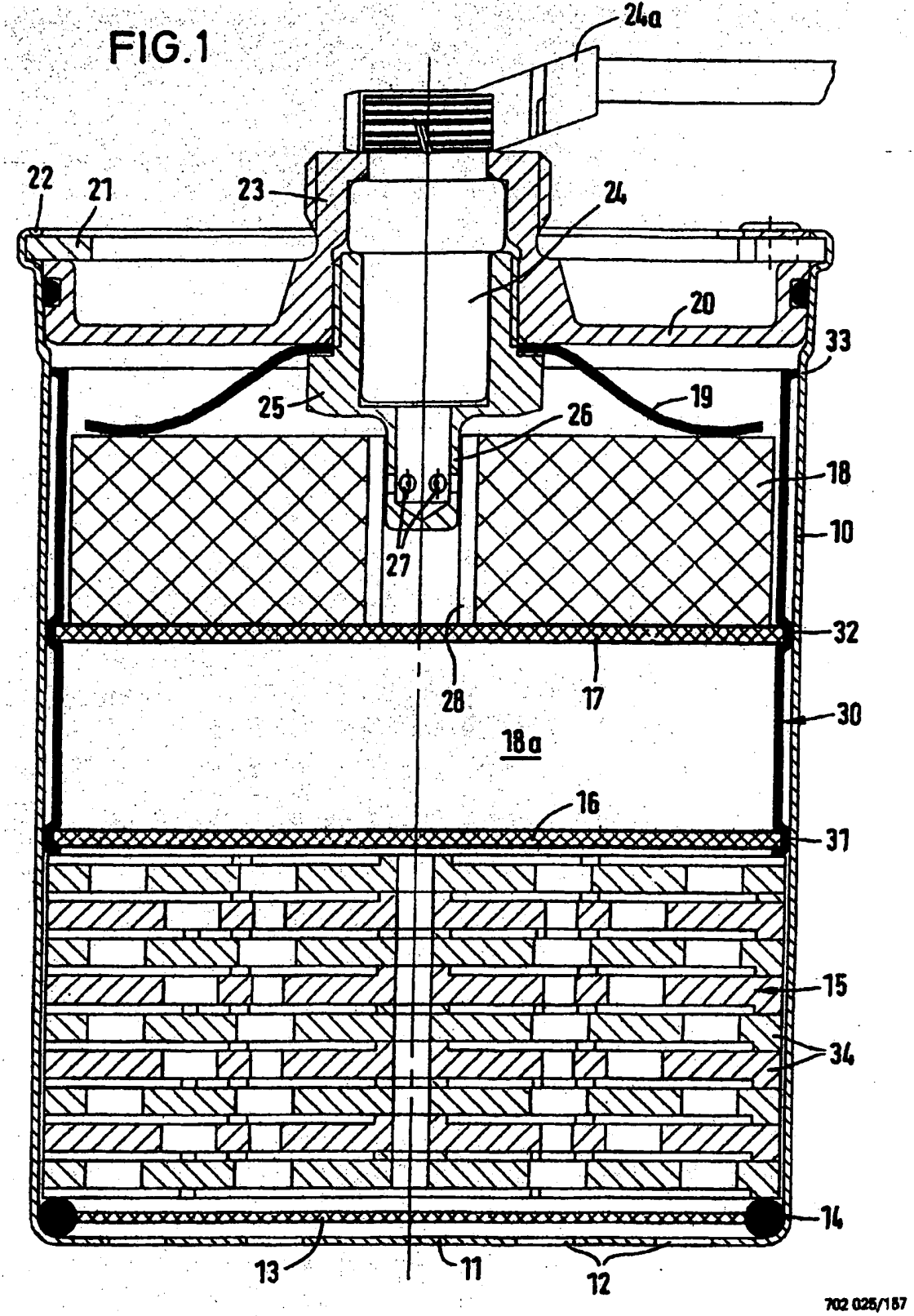
4. Fire extinguisher according to one of claims 1 to 3, characterized in that a cooling apparatus (15) is contained in the housing (10) downstream from the assembly (18) which is not enclosed by the inner sleeve (30).

With 2 page(s) of drawings

– Blank page –

Number: DE 195 46 528 A1
Int. cl.[6]: A 62 C 35/02
Date laid open: 19 June 1997

FIG.1



Number: DE 195 46 528 A1
Int. cl.[6]: A 62 C 35/02
Date laid open: 19 June 1997

FIG. 2